**Title:** How can we reduce are carbon footprint?

**Unit 8: Climate Change & Human Impact**

**Grade Level:** 6-8 (middle school)

**Time:** 2 class periods

**Overview**

This activity will help students visualize the impact human activity on Earth. Students will use a computer simulation to determine how many Earth’s are needed if all 7.1 billion people practiced his or her lifestyles. Before completing this activity students must have an understanding of natural resources as well as renewable versus nonrenewable resources.

**Materials Needed:**

* Laptop computers for online quiz
* Chart paper and markers for group action plan

**NOTE**: This lab was adapted from the education department at the Chicago Botanical Garden[[1]](#footnote-1) and the Alliance to Save Energy[[2]](#footnote-2).

**Objectives:** Students Will Be Able To….

* Increase their awareness of the impact of their choices on the Earth. This awareness is to result in a goal to reduce their personal impact (footprint).

**NYS Living Environment Standards**

* **Key Idea 7:** Human decisions and activities have had a profound impact on the physical and living environment.
  + **Performance Indicator 7.1a** The Earth has finite resources; increasing human consumption of resources places stress on the natural processes that renew some resources and deplete those resources that cannot be renewed.

**Danielson Framework Competencies**

* Domain 3: Instruction
  + Component 3b: Using Questioning and Discussion Techniques

**Day 1: Calculate your carbon footprint**

**DAILY REFLECTION QUESTION:** Greenhouse gases at room temperature are an odorless, colorless gas, but what is CO2 and other gases were solids at room temperature. Would it change the way the human beings response to climate change and global warming why or why not? Does the state of matter make a difference?

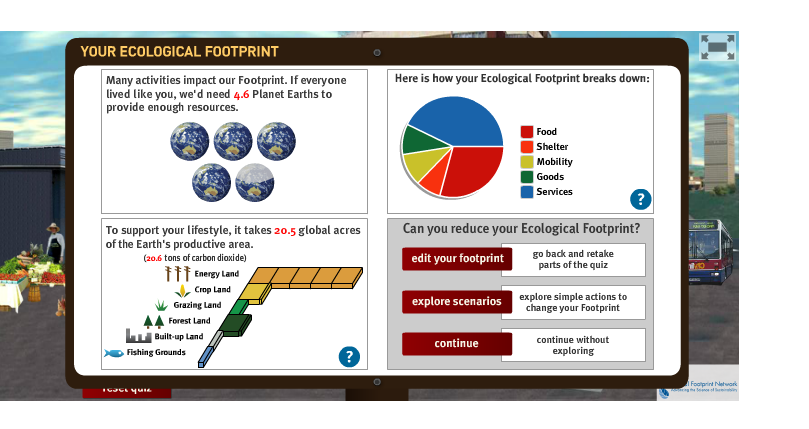
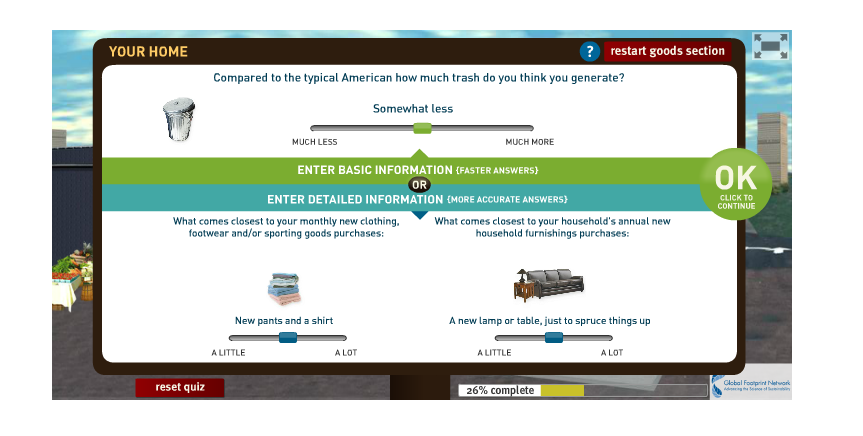
***Turn-and-Talk***

* Students will share their responses to the daily reflection question in their groups.
* Each group will select a representative to share out 1 thing discussed in the group

**Video:** <https://www.youtube.com/watch?v=v9cT-tHoXdI>

**Teacher Demonstration**

* Teacher will model how to complete the Footprint Calculator Game.
* Teacher will make sure students understand the two options for each questions some questions (Basic information vs. Detailed information)
* Footprint Calculator Game: <http://www.footprintnetwork.org/resources/footprint-calculator/>?



**Pair Activity: Footprint Calculator Game**

* Distribute computers (groups can share a computer if there is not a class set)
* Students will complete the game and record their results

**Data Table for each group**

|  |  |  |
| --- | --- | --- |
| **Student Name** | **Number of Earths** | **Number of acres** |
|  |  |  |
|  |  |  |
|  |  |  |

**Discussion Questions**

1. What is the mean number of acres for the students in your group?
2. What is the mean number of Earths needed for the students in your group??
3. Which statistical mean would you use if you did not want to alarm the public?
4. Is it enough to change only the extreme lifestyles? Or does everyone need to change if we are to get the number down to below one Earth needed?
5. What are the next steps if you need to reduce your carbon footprint?

**Day 2: Group Action Plan**

**Do Now:** Make a tally of the Earth’s needed for each student on the board and review the discussion questions from Day 1.

**Activity: Action Plan**

With a partner students will research ways they can reduce their carbon footprint and explain how they will create a month routine to follow the plan.

**Action Plan: Reduce your carbon footprint**

***Directions:*** *With a partner create a plan for reducing your carbon footprint. Use your results from yesterday’s activity and online resources to develop a plan. In 30 days you and your partner will replay the game and see if there is a change in your results.*

***Requirements:***

* *Find 10 ways that you and your partner can reduce the number of Earth’s needed to sustain your lifestyle.*
* *For each one explain how you will use this strategy in for the next 30 days.*

**Assessment:** Group Action Plan Rubric

Students will be assessed on their action plan using a group activity rubric. [[3]](#footnote-3)

**Group members: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Action Plan: Reducing your Carbon Footprint**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Directions:*** *With a partner create a plan for reducing your carbon footprint. Use your results from yesterday’s activity and online resources to develop a plan. In 30 days you and your partner will replay the game and see if there is a change in your results.*  ***Requirements:***   * *Find 10 ways that you and your partner can reduce the number of Earth’s needed to sustain your lifestyle.* * *For each one explain how you will use this strategy in for the next 30 days.* | | | | |
| **Criteria** | **4 – Exemplary** | **3 – Accomplished** | **2 – Developing** | **1 – Beginning** |
| **Cooperation** | * Does a full share of work or more * Assigns a clearly defined role; group members perform roles effectively * Never argues with teammates * Group tries to solve its problems by itself without seeking outside help | * Does an equal share of work * Assigns roles, but roles are not clearly defined or consistently adhered to * Rarely argues * Group seldom solves its problems as a team and asks classmates or teacher for help | * Does almost as much work as others * Assigns roles, but roles are not adhered to * Often sides with friends instead of considering all views * Sometimes argues * Group settles problems and gives up easily | * Does less work than other group members * No effort made to assign roles to group members * Arguments within group * Little attempt to solve problems; gives up easily |
| **Research** | * Collects and contributes accurate content * Goes above and beyond to research information * Communicates and shares all information with the group | * Collects and contributes mostly accurate content * At times, takes initiative to find extra information * Shares information with the group * Usually does the assigned work; rarely needs reminding | * Collects and contributes somewhat accurate content * Uses only materials provided * Shares some information with the group * Rarely does the assigned work; often needs reminding | * Collects and contributes inaccurate content * Does not utilize resources effectively * Keeps information to self; does not share with group * Relies on others to do the work |
| **Presentation** | * Presentation is clever and original * Engaging; captures interest of audience * Appropriate variety of visual aids * Visual aids add to or clarify presentation * Each presenter speaks clearly and loudly; good eye contact; appropriate body language | * Presentation is thoughtful * Presentation is well done; interesting to audience * Some use of visual aids * Visual aids somewhat add to or clarify presentation * Most of the time, presenter speaks clearly and loudly; some eye contact; some use of appropriate body language * Most of the members contributed equally to the presentation | * Presentation is at times clearly presented * Limited use of visual aids * Visual aids do not clarify or add the presentation * Presenter is hard to hear; little eye contact; poor body language * Some members did not contribute equally to the presentation | * Little creativity used; bland * Presentation is hard to follow; poorly organized * No use of visual aids * Presenter cannot be heard; no eye contact; poor body language * Some members did not contribute to the presentation |

Final Score \_\_\_\_\_\_\_\_\_\_\_\_

1. Source: <https://www.chicagobotanic.org/downloads/nasa/Unit_4_Grades_10-12_Activity_4.2_CalculatingYourCarbonFootprint.pdf> [↑](#footnote-ref-1)
2. Source: <https://www.chicagobotanic.org/downloads/nasa/Unit_4_Grades_10-12_Activity_4.2_CalculatingYourCarbonFootprint.pdf> [↑](#footnote-ref-2)
3. cte.sfasu.edu/wp-content/uploads/2012/01/group\_projects.doc [↑](#footnote-ref-3)